DOCUMENT RESUME

ED 059 836 RE 003 938

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TITLE	A Comparison Study of Semantic and Syntactic Cueing by Low Reading Performance College Freshman.
PUB DATE	Dec 71
NOTE	15p.; Paper presented at the National Reading Conference, Tampa, Fla., Dec. 1971
AVAILABLE FROM	National Reading Conference, Inc., Marquette University, 1217 W. Wisconsin Ave., Milwaukee, Wis. 53233
EDRS PRICE	MF-$0.65 HC Not Available from EDRS.
DESCRIPTORS	*College Freshmen; Language Research; Models; Oral Reading; Reading Ability; *Reading Comprehension; Reading Materials; *Reading Research; *Semantics; *Syntax; Vocabulary Skills

ABSTRACT

Syntactic and semantic cueing were examined as used in oral reading by 30 college freshmen, half of whom were higher in vocabulary on the Nelson-Denny Reading Test and half of whom were higher in comprehension scores on the same test. The subjects were selected from 168 freshmen, all of whom were poor readers and spoke predominantly English. All subjects read 150 randomly ordered expressions of three types: sentences, semigrammatical strings (semantically anomalous), and ungrammatical strings. Scoring was based on the number of miscues made on content words and on the number of corrections made in each category. Miscue analysis indicated that higher comprehension subjects used both semantics and syntax in oral reading, while higher vocabulary subjects used syntax but did not seem to use semantics. Corrections analysis yielded no differences in use of syntax and semantics. Higher comprehension subjects had more miscues than the higher vocabulary group. Possible interpretations of these findings are discussed with reference to Goodman's model of reading. Tables and references are included. (MS)

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A COMPARISON STUDY OF SEMANTIC AND SYNTACTIC CUEING BY LOW READING PERFORMANCE COLLEGE FRESHMAN

The general objective of this study was to investigate syntactic and semantic cueing, as used in oral reading by "low reading performance college freshman." Each subject had an overall test score at or below the thirty-fifth percentile on the national norms of the Nelson-Denny Reading Test. A survey of related psycholingusitic research revealed that syntax and semantics effected the perception of utterances (19, 16, 13, 15, 5, 12). Other literature indicated that the same relationship should hold for a language user's comprehension of written expressions (1, 17, 6, 23).

The subjects were thirty freshmen enrolled at Southern Colorado State College. Random sampling resulted in two groups of fifteen each. One group was composed of subjects with an "appreciably" higher reading vocabulary subtest

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score on the Nelson-Denny Reading Test. An "appreciable difference" was defined as twelve or more percentile ranks between scores. The other group was composed of subjects who had an "appreciably" higher subtest score in reading comprehension than reading vocabulary.

Altogether one hundred and eighty-six freshmen met the following requirements for selection: They were "Predominant English Speakers", i.e., they could not carry on a meaningful conversation without recourse to English; they had a composite reading test score at or below the thirty-fifth percentile; and there was an "appreciable difference" between their vocabulary and reading comprehension subtest scores.

Table 1 gives the subtest scores of the two groups on the Nelson-Denny Reading Test and the length of time it took the groups to read an expression-type instrument.

(Insert table 1 here)

This instrument consisted of three sets of fifty typewritten expressions: Sentences, Semi-Grammatical Sentences (which were semantically anomalous), and Ungrammatical Strings. All one hundred and fifty expressions were randomly assembled and presented to the subjects on xerox copies. The same material had been previously presented to subjects on a tape recording by Miller and Isard to effectively demonstrate the effect of semantic and syntactic processing on the auditory perception of utterances (15). All multiple comparisons were by Friedman's Multi-Sample Test. All other comparisons were by Wilcoxon's Rank Tests

The expression-type instrument originally grew out of the finding (14) that content words (nouns, verbs, adjectives and adverbs) were more intelligible when heard in the context of a grammatical sentence than when scrambled and heard in isolation. After reading Chomsky's Syntactic Structures and reviewing some related research, Miller (13) concluded that an important aspect involved in the understanding of any sentence was the determination of the sentence's

phrase structure. Within this theoretical framework Miller and Isard (15) developed an instrument to aid in the determination of how a listener makes use of grammatical context as an aid in his identification of a content word.

The present study, like the Miller and Isard investigation, was limited to syntactic and semantic cueing. Phonological cues were controlled by using the same words throughout. It was reasoned that when an "utterance" is constructed so that a listener can infer its phrase structure, he can use this structure to delimit his choice of content word alternatives, regardless of the content word's position in the "utterance." Similarly it was deemed important to distinguish between a reader's use of syntactic and semantic cueing. However, it must be noted that this study made no attempt to control for the "Pragmatic," or nonlinguistic, information normally present in an ordinary speech transaction.

Originally the Semi-Grammatical Sentences were generated by taking five sentences which were semantically well-formed and had identical phrase structures, but were not necessarily syntactically equivalent (15). By substituting some of the words in one sentence for some in another Semi-Grammatical Sentences were produced as illustrated in the following example:

A witness signed the official legal document.
A jeweler appraised the glittering diamond earrings.
A magazine exposed the shocking political corruption.
A storm prevented the annual company picnic.
A knight slew the ferocious fire-breathing dragon.

Which when scrambled resulted in:

A witness appraised the shocking company dragon.
A jeweler exposed the annual fire-breathing document.
A magazine prevented the ferocious legal document.
A storm slew the official diamond corruption.
A knight signed the costly political picnic.

Although the sentences which resulted from this process appear to be grammatically correct, the semantic cues normally assumed by a reader have been violated (15).

In a third category, Ungrammatical Strings, each set of five expressions was produced by a haphazard permutation of the position of the words to produce expressions as follows:

A legal glittering the exposed the picnic knight.
A diamond shocking the prevented dragon witness.
A political annual the slew document jeweler.
A company ferocious the signed earrings magazine.
A fire-breathing official the appraised corruption storm.

The one hundred and fifty expressions produced were rearranged in a completely random manner. This precluded any violation of the assumption of randomness, upon which statistical operations were based (18). The first few lines of the expression-type instrument were as follows:

Tempers young rhythm ate secret the. Became lecture the bar deep wealthy a. The cleverly disguised criminal fooled everybody. Bloom wildcats loudly yellow healthy. Fooled colored gently the restaurant cancer. A fire-breathing official the appraised corruption storm. Healthy young babies sleep soundly.

The subjects were scored both for the number of miscues made on the content words in each category, and for the number of corrections made on the content words in each category. Self-corrections of miscues were counted as corrections and not as miscues (18).

Conclusions

The results of the miscues studied indicated that the Higher Comprehension subjects used both semantic and syntactic structure in oral reading, whereas the Higher Vocabulary subjects mainly used syntactic structure.

(Insert Tables 2 and 3 here)

The results of the corrections studied indicated that the Higher Comprehension subjects made about the same number of corrections in each category; and that an increase in linguistic structure produced a corresponding decrease in corrections for the Higher Vocabulary Subjects.

(Insert Tables 4 and 5 here)

The Higher Comprehension group produced significantly more miscues than the Higher Vocabulary group. There was no significant difference between the two groups in terms of total number of corrections produced.

(Insert Table six here)

From the results of this investigation, it appears that the subjects who are higher in reading comprehension are using a semantic element in reading that the other subjects are not using. What is not immediately evident is how both groups are using the syntactic element in reading. The first impression one might get is that they are both using it with equal skill, since they both read Semi-Grammatical Sentences better than Ungrammatical Strings of Words. However, if, as many authors indicate, reading comprehension is a language related process (11, 3, 20) then the finding that it is the Higher Comprehension students who make significantly more miscues does not support this conclusion. Instead, the indication is that Higher Comprehension subjects are probably "reading deep structure," and hence producing more miscues when they "retransform" (9, p. 2), to produce the meaning obtained. This finding would be in concord with Morton's earlier findings (17).

Probably, the Higher Vocabulary subjects have become effective "recoders," i.e., they are recoding not only from the grapheme to phoneme, but also have learned to recode the surface aspects of written syntactic structures without using the underlying structure. Properly used syntactic structures should lead to a semantic interpretation. According to Chomsky (4, p. 16), "the syntactic component of a grammar must specify, for each sentence, a <u>deep structure</u> that determines its semantic interpretation and a <u>surface structure</u> that determines its phonetic interpretation."

The Higher Vocabulary subjects made the most corrections on the words in expressions that contained the least linguistic structure. This may indicate a greater concern with pronouncing, or at least knowing the correct word, than with grasping a sentence's meaning. These subjects apparently could not bring their vocabulary to bear on the reading task, because they had limited their choices to "word meanings" and syntactic structure. Clearly, if one is "reading for meaning," it will be the total semantic meaning that determines his lexical item choices.

In contrast it appears that the primary limitation of the Higher Comprehension subjects was their restricted vocabulary. These subjects needed more lexical items to process, since they appeared to be able to respond with material that satisfied both the syntactic and semantic requirements of an expression.

If, as this study indicates, the Higher Comprehension reader is operating as a language user in reading, then where has the reading process broken down for the Higher Vocabulary subjects? Is there a model which will suggest where the problem lies? Although these findings seem to be compatible with Goodman's (7) model of reading, the model is quite complex, as is any model which takes into account all of the diverse aspects of reading. Fortunately, Wales and Marshall (22) have constructed a simpler "Schema of Linguistic Performance" which will serve our purposes:

> ". . .first, it indicates the hypothesized order of processing linguistic information and suggests the most fruitful points of study; secondly, by comparison with alternative formulations empirical grounds for substantive claims can perhaps be tested; thirdly, it helps to keep as a central aim that linguistic performance is best considered as a system and avoids the proliferation of unrelated models which account merely for particular instances; . . ." (22, p. 55)

(Insert "Schema of Linguistic Performance" here)

Wales and Marshall (22) in constructing this "schema" had in mind a continuous unidirectional process with sentences as the basic unit.

The apparent applicability of this "schema" will be clearer after a short discussion of each of its components. First, preliminary recognition is the incomplete sampling of the redundancy available in linguistic surface structure. Next, the state of readiness accounts for the effect of short term memory via a "threshold mechanism," which "is presumably regulated by situational expectancies and feedback instructions on the basis of sentential constraints and semantic coding." Preliminary analysis of surface structure is the stage where competent language users process their bits and pieces of surface structure to provide an input of the deep structure analyser. (However, the Higher Vocabulary subjects studied in this investigation seem to have processed the entire surface structure, and proceeded from the third stage directly to the production of an oral output.) The deep structure analyser assigns relational notions upon a phrase-structure in such a way that its output is a limited set of items. It is at this stage that words are "looked up" in a semantic dictionary, which only operates on syntactically classified material. The conceptual matrix is not clearly differentiated from the semantic interpretation stage by Wales and Marshall (22, p. 55). However, it is only later in production, i.e., the last two stages, that all the structural information is processed.

Although one cannot clearly conclude from this study how the processing in one stage affects the other, one can "hypothesize" that an excessive amount of linguistic input to the preliminary surface structure analyser would create an overload that short circuits to the production stage. "Instead of

going from print to meaning, they wind up with something that isn't meaning at all." (8, p. 462)

Epilogue

The objective findings of this study are interpreted as supporting the position that "Reading is not reading unless it involved some level of comprehension." (21, p. 25) During the last sixty years this position has in one form or another been involved in nearly every debate about reading. Unfortunately, much of the research related to reading has ignored Huey's warning: "With meanings, as with vocal utterance, the sentence-meaning is the natural unit, and smaller divisions considered apart from this are felt as *disjecta membra*." (10, p. 167)

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Table 1

A Descriptive Comparison of the Two Sample Groups

	Sample Groups	Mean	Median	Range
Vocabulary Scores**	High C*	12.33	12	6-26
	High V*	37.26	37	14-83
Comprehension Scores**	High C*	34.60	35	21-57
	High V*	10.40	9	2-30
Reading Time***	High C*	8'40.9"	7'28"	5'39"-13'53"
	High V*	8'37.5"	8"12"	4'53"-9'48"

*High C's are the Higher Comprehension Subjects.
*High V's are the Higher Vocabulary Subjects.
**Scores are percentile ranks.
***Times are minutes and seconds.

Table 2

Results of Friedman's Multi-Sample
Tests on Miscues

Test Results	Rank Totals GS+	SGS+	USW+	S	Rows
Higher Vocabulary Subjects	20.5	24.5	45.0	345.5*	15
Higher Comprehension Subjects	20.5	24.5	45.0	345.5*	15
Main Effects of Expressions on Subjects	20.5	24.5	45.0	345.5*	15

+GS = Grammatical Sentences
+SGS = Semi-Grammatical Sentences
+USW = Ungrammatical Strings of Words
*Significant at the .001 level

Table 3

Results of Wilcoxon's Signed-Rank
Tests on Miscues

Test Results	W+	n
Higher Vocabulary Subjects	37.0	14
Higher Comprehension Subjects	24.5*	14
Main Effects of Expressions on Subjects	23.0*	14

*Significant at the .05 level

Table 4

Results of Friedman's Multi-Sample
Tests on Corrections

Test Results	Rank Totals GS+	SGS+	USW+	S	Rows
Higher Vocabulary Subjects	22.5	28.5	39.0	139.0*	15
Higher Comprehension Subjects	29.5	24.0	31.0	3.5	15
Main Effects of Expressions on Subjects	22.5	28.5	39.0	139.0*	15

+GS = Grammatical Sentences
+SGS = Semi-Grammatical Sentences
+USW = Ungrammatical Strings of Words
*Significant at the .01 level

Table 5

Results of Wilcoxon's Signed-Rank
Tests on Corrections

Test Results	W+	n
Higher Vocabulary Subjects	22.5*	15
Main Effects of Expressions on Subjects	18.5	12

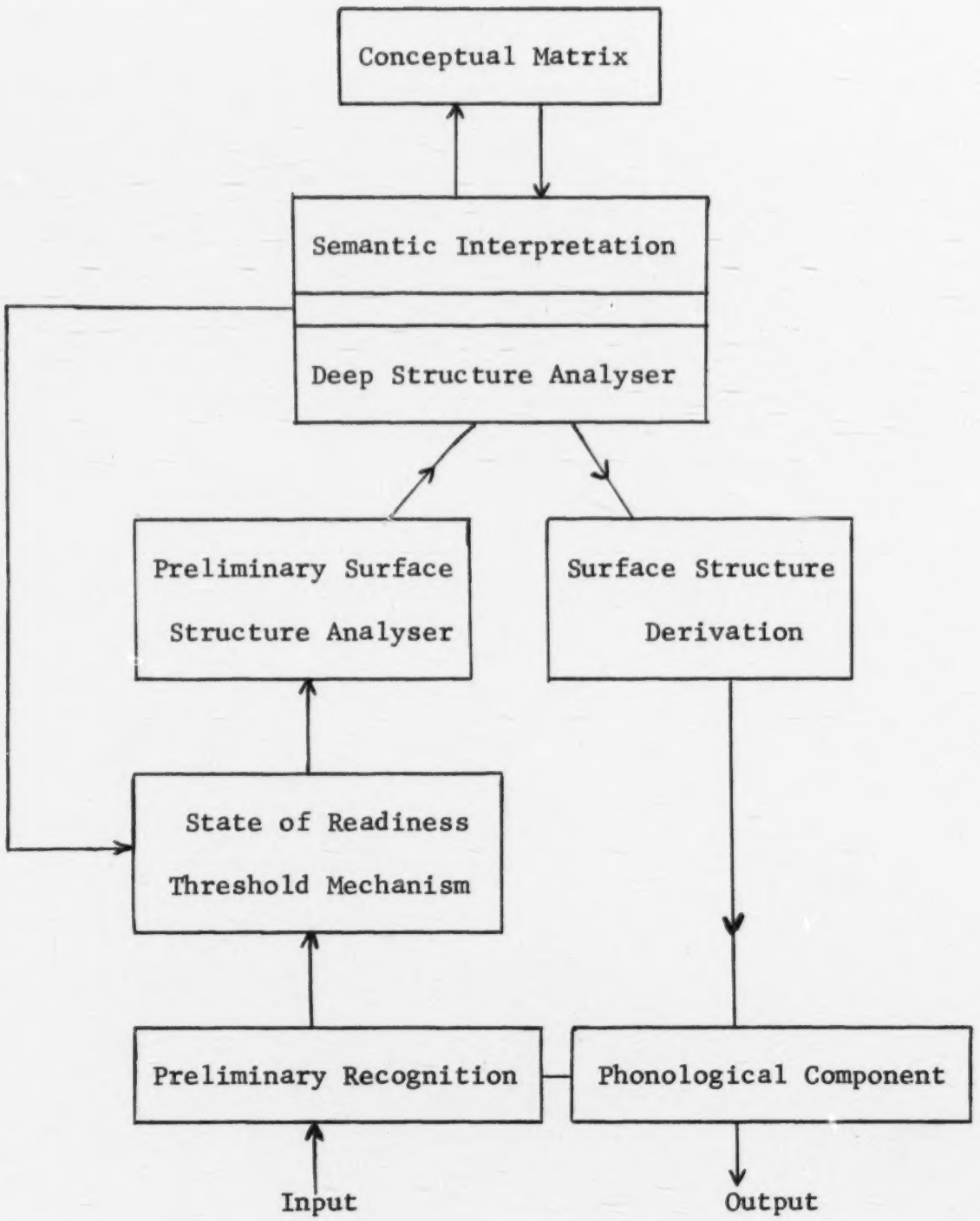
*Significant at the .025 level

Table 6

Wilcoxon Rank-Sum Test to Compare the Main Effects
Between the Subject Groups

Basis of Comparison	Wn	m=n
Miscues	191.5*	15
Corrections	201.5	15

*Significant at the .05 level


Conceptual Matrix
Semantic Interpretation
Deep Structure Analyser
Preliminary Surface Structure Analyser
Surface Structure Derivation
State of Readiness Threshold Mechanism
Preliminary Recognition
Phonological Component
Input
Output